measurements and epidemiologic factors has not been defined in a young cohort. In CARDIA (Coronary Artery Risk Development in Young Adults), a multicenter NHLBI study, 4,243 men and women between the ages of 23 to 35 years old were studied with echocardiography. LVESS was derived from 2-D directed M-mode echo and systolic BP. LVESS (adjusted) was greater in men than women (132 vs 103 gm/cm^2, $p < 0.001$) and blacks than whites (119 vs 112 gm/cm^2, $p < 0.001$). In bivariate analysis, LVESS was correlated with BP, subscapular skinfold thickness (SSFT), height, weight and pulmonary function. In multivariate analysis, the race and gender differences remained significant after adjustment for body size, BP, and other CVD risk factors. Independent predictors of LVESS included systolic BP, SSFT and height, but not physical activity. Overall variance of LVESS explained by the models in each race-sex subgroup (R^2) ranged from 0.17 to 0.23.

Conclusions: 1) LVESS is greater in young men versus women and blacks versus whites; and 2) LVESS in young adults is correlated with traditional CVD risk factors and anthropometric features.

1009-132 Is Left Ventricular Mass Greater in African Americans Compared With Whites in Families With a History of Premature Coronary Heart Disease?

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Increased left ventricular mass (LVM) has been shown to be more common in African Americans (AA) than in whites (W) and is a strong, independent risk factor for coronary heart disease (CHD). To determine whether racial differences in LVM also exist among families at high risk for CHD, LVM was measured in AA and W asymptomatic siblings (SIBS, ages 30–59) of patients with premature CHD using M-mode echocardiography and indexed to height and to body surface area (BSA). No significant racial differences were observed for LVM indexed to height or BSA in male or female SIBS. Using separate multiple linear regression analyses in men and women, body mass index (BMI) ($p < 0.001$) and systolic blood pressure (SBP) ($p < 0.001$) were significant predictors of LVM but age and race were not. When hypertensive SIBS were removed from these analyses, race still did not predict LVM. Thus, while there are racial differences in left ventricular mass in the general population, African American and white SIBS at high risk for premature CHD have similar LVM.

	W Males (n = 144)	AA Males (n = 43)	W Females (n = 173)	AA Females (n = 75)
Age (years)	46 ± 7	45 ± 8	45 ± 8	47 ± 7
BMI (g/m^2)	27.7 ± 3.7	28.6 ± 5.1	27.4 ± 6.0	30.6 ± 7.6
SBP (mmHg)	134 ± 15	135 ± 14	128 ± 15	135 ± 18
LVM/height (g/m)	108 ± 24	112 ± 23	92 ± 23	97 ± 27
LVM/BSA (g/m^2)	94 ± 18	96 ± 19	84 ± 19	85 ± 22

Mean ± SD

1009-133 Demographics and Correlates of Five-Year Change in Echocardiographic Left Ventricular Mass in Young Adults: The CARDIA Study

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Left ventricular mass (LVM) is known to be a powerful independent predictor for cardiovascular disease (CVD) events in adults in the presence or absence of clinical hypertension or CVD. However, little is known about the correlates of *change* in LVM in young adults. The CARDIA Study is an NHLBI-sponsored multicenter longitudinal population-based study of equal numbers of black and white men and women, who were ages 23 to 35 at the time of their first echo exam in Year 5 (1990–91); half the cohort (2 of 4 centers) had a repeat echo exam in Year 10. Preliminary analyses were performed in 1,532 participants who had paired echo studies. In bivariate analyses, significant ($p < 0.05$) predictors of 5-yr change (Δ) in 2D echo-directed M-mode LVM included: Year 5 body mass index (BMI)–a measure of obesity–and systolic BP, but not 5-yr Δ in these variables. Multivariable analyses by race-gender subgroup revealed a significant ($p = 0.0001$) 5-yr Δ in LVM only in black women (median increase = 5.1 gm). Furthermore, a 5 kg/m^2 increase in Year 5 BMI was associated with a 1.5 gm increase in Δ LVM in black women ($p = 0.01$).

In conclusion, in young adults in the CARDIA study: (1) modest 5-yr (median) increases in echo LV mass were detected in black women, and (2) 5-yr changes in LV mass were related to Year 5 body mass index and systolic blood pressure.

1009-134 Biochemical Screening for Left Ventricular Dysfunction

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Plasma concentrations of N-Terminal Atrial Natriuretic Peptide (N-ANP) and Brain Natriuretic Peptide (BNP) are known to be raised in patients with CHF and left ventricular systolic dysfunction (LVD). We investigated whether BNP and N-ANP would be suitable screening tools for identifying subjects in the general population with LVD. We studied 557 men and women aged 55–74, randomly sampled from the North Glasgow Population. Left ventricular function was assessed echocardiographically by a Biplane Simpson's Rule Ejection Fraction. A LVEF of $\leq$ 30% has be taken as LVD as it represents a 33% reduction on the mean value (47.7%) for subjects free of cardiovascular disease within this population. An abnormal ECG was defined as the presence of q waves, LBBB and ST/T wave changes. 4.8% (30/626) had a LVEF $\leq$ 30%, 557 had plasma samples for BNP and N-ANP measured. Both BNP and N-ANP were significantly raised in subjects with LVD ($p < 0.01$) see Table:

N-ANP (ng/ml)	LVEF $\geq$ 30%	LVEF > 30%	BNP (pg/ml)	LVEF $\leq$ 30%	LVEF > 30%
Median	3.2	1.8	Median	27.5	11
IQR*	2.1, 5.4	1.2.2.7	IQR	21.5, 34.5	5.7, 17.2

* Interquartile Range.

A BNP concentration > 14.5 pg/ml gave an 83% sensitivity and 90% specificity for diagnosing LVD. It was superior to N-ANP (conc. > 2.8 ng/ml): sensitivity 64%, specificity 75%. Targeting the analysis to subjects with an abnormal ECG (using BNP) improved the sensitivity to 92% (specificity 71%). Plasma concentrations of BNP are valuable in screening individuals suspected of having LVD.

1010 Health Care Delivery: Lessons in Coronary Disease

Tuesday, March 18, 1997, Noon–2:00 p.m.
Anaheim Convention Center, Hall E
Presentation Hour: Noon–1:00 p.m.

1010-135 10 Year Natural History of Invasive Procedures for Heart Disease in California: 1983–1993

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Cardiac catheterization (CC), percutaneous transluminal coronary angioplasty (PTCA), and heart surgery (HS) are invasive procedures for heart disease. The use rates of these procedures and their impact on cardiovascular disease (CVD) death rates are unknown. We obtained State of California primary discharge data information from the Office of Statewide Health, Planning, and Development (OSHPD) and CVD death rates from the Office of Vital Statistics and annual estimates of California state population (POP) from the US Census Bureau for 1983–1993. For the 10 year period per 100,000 population, we found: 1) POP increased 23.1%, 2) CC increased 103.8%, 3) HS increased 15.7%, 4) PTCA increased 306.0%, 5) CVD decreased 19.4% and 6) the ratio of CC to HS and PTCA fell 18.9%. We created a multivariate linear regression model to predict CVD death rates. The model was highly statistically significant ($r^2 = 0.97$; $P < 0.0001$) and showed a decline in CVD death rates associated with year ($p = 0.0012$) and with HS rates ($p = 0.0285$) but not associated with PTCA rates ($p = 0.0775$). We conclude: 1) the growth in CC was due to the introduction and growth of PTCA, 2) the disproportionate growth in CC suggests that appropriateness of CC, HS and PTCA needs to be reevaluated. The cost-effectiveness of this invasive strategy to manage heart disease is unclear. Statewide tracking of rates of procedures and their costs are essential to optimize societal outcomes given scarce resources.